

研究论文

铟酞菁/聚甲基丙烯酸甲酯复合物固体光限幅器性能

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摘要 将在溶液中表现出优良非线性光学和光限幅性能的铟酞菁及其二聚物嵌入到非光学活性的聚甲基丙烯酸甲酯(PMMA)中, 用传统的旋转涂膜法制备得到具有较高光学质量的复合物薄膜, 用开孔Z-扫描方法在532 nm处研究了复合物薄膜材料的线性光学和非线性光学性能. 结果表明, 无论是铟酞菁单体还是轴向氧桥联的铟酞菁二聚物, 其PMMA复合材料的光限幅性能均显著优于相应的酞菁分子在溶液中的光限幅性能.

关键词 [铟酞菁](#) [固体复合物材料](#) [光限幅性能](#) [聚甲基丙烯酸甲酯](#)

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Passive Optical Limiting Performance of Solid-State Polymer-Indium Phthalocyanine Composite Materials

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Abstract Optical limiting, an important application of nonlinear optics, useful for the protection of human eyes and optical sensors from intense laser pulse, is of great interest to the private industry, law enforcement and military. In this paper, indium phthalocyanine-based polymer solid-state passive optical limiters were fabricated by embedding the phthalocyanine as inclusion in poly(methylmethacrylate) host. These composite films exhibit an enhanced nonlinear optical response and lower saturable fluence for optical limiting in comparison to the same Pc molecules in solution. All open aperture Z-scans performed at 532 nm display a decrease in transmittance about the focus which is typical for an induced positive nonlinear absorption of incident light due to reverse saturable excited state absorption.

Key words [Indium phthalocyanines](#) [Solid state composite material](#) [Optical limiting performance](#) [Poly\(methylmethacrylate\)](#)

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